



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

August 16, 2012

Mr. John Ventosa, Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

**SUBJECT: INDIAN POINT NUCLEAR GENERATING UNITS 2 AND 3 – NRC INSPECTION
REPORT 05000247/2012009 AND 05000286/2012008 AND NOTICES OF
VIOLATION**

Dear Mr. Ventosa:

On April 26, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Units 2 and 3. The enclosed inspection report documents the inspection results which were discussed on April 26, 2012, with Mr. Lawrence Coyle, and other members of your staff. Following in-office reviews, an additional meeting was conducted by telephone with Mr. Patric Conroy, Director, Nuclear Safety Assurance, on June 8, 2012, and an exit meeting was conducted by telephone with Mr. Patric Conroy and other members of your staff on July 20, 2012.

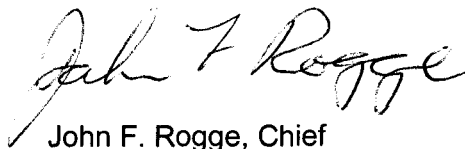
The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed the ongoing implementation of your corrective actions to restore full compliance with Title 10 of the Code of Federal Regulations, Part 50, Appendix R, Section III.G.2 regarding denied exemptions to implement operator manual actions in lieu of meeting the aforesaid fire protection regulations.

Two violations are cited in the enclosed Notices of Violation and the circumstances surrounding them are described in detail in the subject inspection report. The violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The violations involved the use of unapproved operator manual actions to mitigate safe shutdown equipment malfunctions caused by a fire-induced single spurious actuation at Indian Point Units 2 and 3, in lieu of protecting the equipment in accordance with 10 CFR Part 50 Appendix R, Section III.G.2. Although determined to be of very low safety significance (Green), these violations are being cited in the Notices because not all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation were satisfied. Specifically, Entergy Nuclear Operations, Inc. (ENO) failed to restore compliance within a reasonable amount of time after the violations were identified to nuclear power plant licensees in Regulatory Issue Summary 2006-10, Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions, on June 30, 2006. You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

One other finding of very low safety significance (Green) was also identified. This finding was determined to be a violation of NRC requirements. However, because of its very low safety significance, and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a written response within 30 days of the date of this inspection report with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Senior Resident Inspector at Indian Point Unit 2 or 3. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the Senior Resident Inspector at Indian Point Unit 2 or 3.

In accordance with Title 10 of the *Code of Federal Regulations* Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,



John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos. 50-247, 50-286
License Nos. DPR-26, DPR-64

Enclosures:

1. Notice of Violation
2. Inspection Report 05000247/2012009 and 05000286/2012008
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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Sincerely,

/RA/

John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos. 50-247, 50-286
License Nos. DPR-26, DPR-64

Enclosures:

1. Notice of Violation
2. Inspection Report 05000247/2012009 and 05000286/2012008
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

DOCUMENT NAME: G:\DRS\Engineering Branch 3\IPEC OMA Inspection\IP OMA Inspection Report.doc
ADAMS ACCESSION NUMBER: ML12229A128

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
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DATE	8/1/12	8/2/12	8/10/12	8/12/12	

OFFICE	RI/DRS	RI/DRS			
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ENCLOSURE 1

NOTICE OF VIOLATION – Indian Point Unit 2

Entergy Nuclear Operations, Inc.
Indian Point Nuclear Generating Unit 2

Docket No: 50-247
License No: DPR-26

During an NRC inspection conducted April 23 through April 26, 2012, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

License Condition 2.K specifies, in part, that Entergy Nuclear Operations, Inc., (ENO) shall implement and maintain in effect all provisions of the NRC-approved fire protection program as described in the Updated Final Safety Analysis Report.

The Updated Final Safety Analysis Report, Section 9.6 specifies that ENO will meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, which requires, in part, except as provided for in paragraph G.3 of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area, one of the means of ensuring that one of the redundant trains is free of fire damage shall be provided, per the requirements in G.2.a – G.2.f.

Contrary to the above, between June 30, 2006, and April 26, 2012, ENO failed to implement all provisions of the approved fire protection program. Specifically, the safe shutdown strategy for Indian Point Unit 2 relied upon unapproved operator manual actions to mitigate post-fire safe shutdown equipment malfunctions caused by a single spurious actuation, in lieu of protecting the equipment in accordance with 10 CFR Part 50 Appendix R, Section III.G.2, per the requirements in G.2.a – G.2.f. The specific operator manual actions and fire areas and fire zones that are in violation of Appendix R, Section III.G.2 are listed in the Indian Point Unit 2 Denied OMA Summary Table of NRC Inspection Report 05000247/2012009 and 05000286/2012008. The use of manual actions in lieu of providing the required protection requires prior NRC approval.

This violation is associated with a Green Significance Determination Finding.

Pursuant to the provisions of 10 CFR 2.201, ENO is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the

Enclosure 1

license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 16th day of August, 2012

NOTICE OF VIOLATION – Indian Point Unit 3

Entergy Nuclear Operations, Inc.
Indian Point Nuclear Generating Unit 3

Docket No: 50-286
License No: DPR-64

During an NRC inspection conducted April 23 through April 26, 2012, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

License Condition 2.H specifies, in part, that Entergy Nuclear Operations, Inc., (ENO) shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Final Safety Analysis Report.

The Final Safety Analysis Report, Section 9.6.2 specifies that ENO will meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, which requires, in part, except as provided for in paragraph G.3 of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area, one of the means of ensuring that one of the redundant trains is free of fire damage shall be provided, per the requirements in G.2.a – G.2.f.

Contrary to the above, between June 30, 2006 and April 26, 2012, ENO failed to implement all provisions of the approved fire protection program. Specifically, the safe shutdown strategy for Indian Point Unit 3 relied upon unapproved manual operator actions to mitigate post-fire safe shutdown equipment malfunctions caused by a single spurious actuation, in lieu of protecting the equipment in accordance with 10 CFR Part 50 Appendix R, Section III.G.2, per the requirements in G.2.a – G.2.f. The specific operator manual actions and fire areas and fire zones that are in violation of Appendix R, Section III.G.2 are listed in the Indian Point Unit 3 Denied OMA Summary Table of NRC Inspection Report 05000247/2012009 AND 05000286/2012008. The use of manual actions in lieu of providing the required protection requires prior NRC approval.

This violation is associated with a Green Significance Determination Finding.

Pursuant to the provisions of 10 CFR 2.201, ENO is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified

Enclosure 1

in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 16th day of August, 2012

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-247, 50-286

License Nos.: DPR-26, DPR-64

Report Nos.: 05000247/2012009, 05000286/2012008

Licensee: Entergy Nuclear Operations, Inc. (ENO)

Facility: Indian Point Nuclear Generating Units 2 and 3

Location: 450 Broadway, GSB
Buchanan, NY 10511-0249

Dates: April 23 - April 26, 2012

Inspectors: D. Orr, Senior Reactor Inspector
W. Schmidt, Senior Reactor Analyst
J. Lilliendahl, Reactor Inspector

Approved by: John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

Enclosure 2

SUMMARY OF FINDINGS

IR 05000247/2012009, 05000286/2012008; 4/23/2012 – 4/26/2012; Indian Point Nuclear Generating Units 2 and 3; Annual Follow-up of Selected Issues Inspection.

The report covered a one-week annual follow-up of selected issues inspection by specialist inspectors. Three findings of very low significance were identified. Two of these findings were determined to be cited violations and one of these findings was determined to be a non-cited violation. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, Significance Determination Process. Cross-cutting aspects associated with findings are determined using IMC 0310, Components Within The Cross-Cutting Areas. Findings for which the significance determination process (SDP) does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance (Green), involving a cited violation of Indian Point Unit 2 Operating License Condition 2.K to implement and maintain all aspects of the approved fire protection program. Specifically, ENO failed to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remained free from fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of protecting a redundant safe shutdown train, ENO utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by postulated single fire-induced circuit faults. ENO submitted an exemption request (ML090770151) on March 6, 2009, in which it sought exemption from requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. However, several OMAs within the exemption request were denied because ENO failed to demonstrate that the OMAs were feasible and reliable, or to appropriately evaluate fire protection defense-in-depth. ENO's performance deficiency delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown. ENO has entered this issue into the corrective program for resolution. The inspectors found the manual actions in addition to roving fire watches in all affected areas to be reasonable interim compensatory measures pending final resolution by ENO.

ENO's failure to protect components credited for post-fire safe shutdown from fire damage caused by single spurious actuation is considered a performance deficiency. The performance deficiency was more than minor because it affected the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to an external event to prevent undesirable consequences in the event of a fire. Specifically, the use of operator manual actions during post-fire safe shutdown is not as reliable as normal systems operation which could be utilized had the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 been met and, therefore, prevented fire damage to credited components and/or cables. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and

a Senior Reactor Analyst conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). This finding does not have a cross cutting aspect because the performance deficiency occurred greater than three years ago when the exemption request was submitted to the NRC on March 6, 2009, and is not indicative of current licensee performance. (Section 40A2.1)

- Green. The inspectors identified a finding of very low safety significance (Green), involving a cited violation of Indian Point Unit 3 Operating License Condition 2.H to implement and maintain all aspects of the approved fire protection program. Specifically, ENO failed to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remained free from fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of protecting a redundant safe shutdown train, ENO utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by postulated single fire-induced circuit faults. ENO submitted an exemption request (ML090760993) on March 6, 2009, in which it sought exemption from requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. However, several OMAs within the exemption request were denied because ENO failed to demonstrate that the OMAs were feasible and reliable, or to appropriately evaluate fire protection defense-in-depth. ENO's performance deficiency delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown. ENO has entered this issue into the corrective program for resolution. The inspectors found the manual actions in addition to roving fire watches in all affected areas to be reasonable interim compensatory measures pending final resolution by ENO.

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- Green. The inspectors identified a Green, Non-Cited Violation of the Indian Point Nuclear Generating Unit No. 2 Amended Facility Operating License, Condition 2.K, in that ENO failed to implement and maintain in effect all provisions of the NRC-approved fire protection program as described in the Updated Final Safety Analysis Report. Specifically, ENO failed to minimize transient combustible materials within the primary auxiliary building (PAB) and stored a compressed gas cylinder containing hydrogen gas

under cable trays. The hydrogen gas cylinder was inappropriately left in its storage location after a calibration gas cylinder change-out occurred for the waste gas analyzer. ENO promptly entered this issue into its corrective action program and removed the hydrogen cylinder from the PAB. ENO initiated a corrective action to evaluate the identified condition and ensure actions to prevent its recurrence.

ENO's failure to remove the compressed hydrogen gas cylinder from the PAB after its intended use as a calibration gas for the waste gas analyzer was a performance deficiency. This finding was more than minor because it was associated with the External Factors attribute (fire) of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the hydrogen gas cylinder was stored below cable trays in an area that includes safe shutdown circuits and the associated cables were at increased risk to fire damage. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and a Senior Reactor Analyst conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance associated with the work practice attribute because ENO personnel did not follow procedure, Control of Combustibles, EN-DC-161, Rev. 6, as written and did not remove the hydrogen gas cylinder from the PAB after it was disconnected from the waste gas analyzer contrary to Control of Combustibles, EN-DC-161, Rev. 6. (H.4(b) per IMC 0310). (Section 4OA2.3)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Background

The NRC requirements related to fire protection are provided in Title 10 of the Code of Federal Regulations (CFR) Section 50.48. In accordance with 10 CFR 50.48(b), nuclear power plants licensed to operate before January 1, 1979 are required to meet Section III.G, of 10 CFR Part 50, Appendix R. The underlying purpose of Section III.G of 10 CFR Part 50, Appendix R, is to ensure that the ability to achieve and maintain safe-shutdown is preserved following a fire event.

Paragraph III.G.2 of Appendix R requires one of the following means to ensure that a redundant train of safe-shutdown cables and equipment is free of fire damage, where redundant trains are located in the same fire area outside containment:

- a. Separation of cables and equipment by a fire barrier having a three-hour rating;
- b. Separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or,
- c. Enclosure of cables and equipment of one redundant train in a fire barrier having a one-hour rating and with fire detectors and an automatic fire suppression system installed in the fire area.

Inside containments one of the fire protection means specified above or one of the following fire protection means shall be provided:

- d. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards;
- e. Installation of fire detectors and an automatic fire suppression system in the fire area; or
- f. Separation of cables and equipment and associated non-safety circuits of redundant trains by a noncombustible radiant energy shield.

However, as a result of safe-shutdown focused inspections conducted in 2000, the NRC identified that, in lieu of the methods specified in Paragraph III.G.2, some licensees, including ENO, were crediting operator manual actions (OMAs) to achieve and maintain safe shutdown in the event of a fire impacting areas in which both trains of a safe-shutdown system or component are co-located.

In 2006, the NRC issued Regulatory Issue Summary 2006-10, Regulatory Expectations with Appendix R, Paragraph III.G.2, Operator Manual Actions, which clarified Appendix R and that OMAs are not permitted, unless they have been specifically approved by the NRC as part of a licensee's request for exemption from the requirements of Paragraph III.G.2. The NRC also issued EGM 07-004 (ML071830345), which granted enforcement discretion for licensees relying on OMAs and provided until March 6, 2009 for licensees to complete corrective actions. Corrective actions included establishing compliance with fire protection regulations or, as appropriate, submitting an exemption request to the NRC to implement OMAs in lieu of fire protection regulations.

In response to this issue, on March 6, 2009, ENO submitted exemption requests for Indian Point Nuclear Generating Units 2 and 3 (ML090770151 and ML090760993) in which it sought exemption from certain requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. Because the acceptability of the OMAs was being considered under this exemption request, enforcement discretion continued for the duration of the NRC review. The NRC considered ENO's exemption requests, as supplemented by information provided by ENO in response to NRC requests for additional information.

The period of enforcement discretion for noncompliance with NRC fire protection requirements at Indian Point Nuclear Generation Units 2 and 3 ended with the NRC issuance of the February 1, 2012, letters (ML112140509 and ML112200442) documenting completion of the NRC review. The NRC recognized that ENO implemented additional compensatory measures (fire watches in all affected fire areas) to enhance the fire protection response in the areas. In a triennial fire protection inspection in June 2011 (ML111920339), NRC inspectors assessed the feasibility of these compensatory measures. In addition, NRC fire protection inspections have verified that Indian Point Nuclear Generating Units 2 and 3 have implemented a defense-in-depth fire protection program, including a site fire brigade, that is trained and equipped to respond to and fight fires.

In order to determine how the denied OMAs affected ENO's compliance with Appendix R requirements, the NRC requested information from ENO about the schedule and plans for bringing Indian Point Nuclear Generating Units 2 and 3 into full compliance (ML12031A176). ENO responded on March 1, 2012 (ML12074A028) with a proposed schedule that showed full restoration of compliance for all but two of the OMAs by the fourth quarter of 2012, and for the final two OMAs by the Unit 2 refueling outage in Spring 2014.

This report presents the results of a problem identification and resolution annual follow-up of selected issues inspection conducted in accordance with NRC Inspection Procedure (IP) 71152, Problem Identification and Resolution to review ENO's implementation of corrective actions to restore full compliance regarding the use of OMAs.

The objectives of this inspection were to:

- a. Assess the adequacy of compensatory measures for unapproved OMAs;
- b. Verify commitments to resolve all unapproved OMAs were appropriately entered into the corrective action program (CAP);
- c. Review updates to procedures, OMA feasibility and reliability studies, and safe-shutdown analyses; and,
- d. Review progress to date and the proposed schedule for restoring compliance.

Specific documents reviewed by the inspectors are listed in the attachment.

4. OTHER ACTIVITIES [OA]

4OA2 Problem Identification and Resolution (71152 – 1 sample)

a. Inspection Scope

The inspectors assessed ENO's problem identification threshold, extent of condition reviews, compensatory actions, and timeliness of corrective actions to determine whether ENO was appropriately identifying, evaluating, and correcting problems associated with unapproved OMAs.

The inspectors reviewed the fire hazard analysis, safe shutdown analysis and supporting licensing and design basis documents to understand the structures, systems, and components required for fire safe shutdown. The inspectors reviewed the fire safe shutdown operating procedures to verify that all OMAs were either granted an exemption or were being addressed by the corrective action program. The inspectors reviewed condition reports to evaluate the adequacy of evaluations and corrective actions with respect to the denied OMAs. The fire protection engineer and safe shutdown engineer were interviewed to evaluate the feasibility of the proposed plan to restore compliance and to assess corrective actions taken to date.

The inspectors previously walked down all denied OMAs as part of the 2011 triennial fire protection inspection to assess the feasibility of the OMAs. The inspectors walked down portions of the OMAs to re-validate the feasibility of the actions. The inspectors walked down all fire zones that credited denied OMAs to assess the fire risk significance which can be affected by ignition sources, transient and fixed combustibles, or absence of train separation, detection, and automatic suppression.

The inspectors reviewed condition reports, fire watch logs, and fire protection program impairment requirements to verify that compensatory measures in the form of fire watches were being adequately performed as required by the fire protection program.

b. Findings

1. Failure to Protect Safe Shutdown Equipment from the Effects of Fire (Unit 2)

Introduction. The inspectors identified a finding of very low safety significance (Green), involving a cited violation of Indian Point Unit 2 Operating License Condition 2.K to implement and maintain all aspects of the approved fire protection program. Specifically, ENO failed to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remained free from fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of protecting a redundant safe shutdown train, ENO utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by postulated single fire-induced circuit faults. ENO submitted an exemption request (ML090770151) on March 6, 2009, in which it sought exemption from requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. However, several OMAs within the exemption request were denied

because ENO failed to demonstrate that the OMAs were feasible and reliable, or to appropriately evaluate fire protection defense-in-depth. ENO's performance deficiency delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown.

Description. On June 30, 2006, the NRC issued Regulatory Issue Summary (RIS) 2006-10, Regulatory Expectations with Appendix R, Paragraph III.G.2, Operator Manual Actions, which clarified Appendix R and that OMAs are not permitted, unless they have been specifically approved by the NRC as part of a licensee's request for exemption from the requirements of Paragraph III.G.2. In addition to information provided to the licensees in RIS 2006-10, the NRC issued enforcement guidance memorandum (EGM) 07-004, which granted enforcement discretion for licensees relying on noncompliant OMAs to bring themselves back into compliance with the existing regulations. The enforcement discretion provided licensees until March 6, 2009, to complete their corrective actions.

ENO submitted exemption requests on March 6, 2009 for OMAs in several non-compliant fire areas. The NRC considered ENO's exemption requests, as supplemented by information provided by ENO in response to NRC requests for additional information. On February 1, 2012, the NRC denied many of the requested exemptions based on lack of fire protection defense-in-depth, such as detection or automatic suppression, or lack of time margin available to complete the OMA. The NRC's denial of several OMAs within the exemption requests was based on guidance to the NRC staff and available to the industry. NUREG 1852, Demonstrating the Feasibility and Reliability of OMAs in Response to Fire, published October 2007, page 1-2, states that additional considerations to ensure that adequate defense-in-depth such as fire detection and suppression is maintained are addressed in Regulatory Guide (RG) 1.189 and should be considered when applying for an exemption or license amendment. RG 1.189, Fire Protection Program for Nuclear Power Plants, Rev. 1, March 2007, (in effect when NUREG 1852 was issued) Section 5.3.3 similarly states that all fire-related operator manual actions must be feasible and reliable. RG 1.189 further states that the use of operator manual actions does not obviate the detection and suppression capabilities that are required by the regulations and in addition, the omission or elimination of these capabilities in an area containing systems, structures, or components (including circuits) important to safety would generally be considered an adverse effect on safe shutdown since it would reduce, at a minimum, fire protection defense-in-depth.

ENO's failure to demonstrate that several OMAs were feasible and reliable, and to appropriately evaluate fire protection defense-in-depth delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown. ENO entered this issue into its CAP for long term resolution as CR-IP2-2012-00654. Interim compensatory measures for the fire protection non-compliances included roving fire watches in all affected fire areas and were initiated in June 2011. The inspectors considered the interim compensatory measures reasonable pending final resolution. ENO responded to the NRC in a letter dated March 1, 2012 (ML12074A028) with a proposed schedule to resolve all Unit 2 non-compliances for all but two of the OMAs by the fourth quarter of 2012, and for the remaining two OMAs by the Unit 2 refueling outage in Spring 2014.

Additionally, the inspectors identified that ENO failed to identify two OMAs that were being relied upon to achieve and maintain safe shutdown in the event of a fire impacting FZ F/7A. During plant walkdowns, the inspectors noted an emergency control station within the 480V switchgear room that provided an isolation function and start and stop controls for the 21 charging pump. Entergy engineers informed the inspectors that the emergency control station was installed as a plant modification under ER-IP2-03-21959 in 2003 to address a previously identified Appendix R cable separation concern in fire zone (FZ) F/7A. The emergency control station isolates control circuits that terminate at a local control panel for the charging pumps. The 21 charging pump can be isolated from the effects of a fire in FZ F/7A and started in the 480V switchgear room from the emergency control station. Entergy failed to include this unapproved operator manual action in its exemption request submitted on March 6, 2009 (ML090770151). During interviews with Entergy engineers regarding the charging pump local control panel and its impact on charging pump operation for a fire in FZ F/7A, the inspectors also identified that an additional OMA was necessary to operate the 21 charging pump. The additional OMA required local operation of the 21 charging pump scoop tube positioner to control the 21 charging pump speed. Entergy promptly entered these missed OMAs into its corrective action program as CR-IP2-2012-03024 and verified the OMAs were feasible and reliable and noted that fire watches as compensatory measures for other OMAs within this fire zone remained in place. The inspectors considered Entergy's compensatory measures and immediate corrective actions adequate for the missed OMAs. Similar to the denied OMAs, Entergy planned to resolve the missed OMAs and establish compliance with 10 CFR Part 50, Appendix R, Section III.G.2.

Analysis. The inspectors identified a performance deficiency in that ENO failed to protect components credited for post-fire safe shutdown from fire-induced damage. The denied OMAs, as well as the missed OMAs, were considered a single performance deficiency as the apparent causal factors were related, an inadequate review and evaluation of operator manual actions, and also occurred when the exemption request was submitted to the NRC on March 6, 2009. The performance deficiency was more than minor because it was associated with the Protection against External Events (Fire) attribute of the Mitigating Systems Cornerstone and negatively affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences in the event of a fire. Specifically, the use of OMAs during post-fire shutdown is not as reliable as normal system operation from the main control room which would be utilized had the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 been met. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and a Senior Reactor Analyst conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). This finding does not have a cross cutting aspect because the performance deficiency occurred greater than three years ago when the exemption request was submitted to the NRC on March 6, 2009, and is not indicative of current licensee performance.

The inspectors determined the issue did not screen to Green with a Phase 1 SDP because the finding category was post-fire safe shutdown and involved operator manual actions. A Phase 3 SDP was performed by a Senior Reactor Analyst (SRA) because the Fire Protection Phase 2 SDP is intended to support the assessment of known issues

only in the context of an individual fire area and this issue involved multiple fire areas and fire zones. However, the SRA determined the Phase 2 SDP tools could be used on an area by area basis to inform the Phase 3 SDP and screen fire zones if a sufficient basis was developed for each fire zone and justified an absence of credible fire scenarios such that mitigating equipment or its associated cables would not be damaged or a plant transient would not occur. Guidance in each attachment of IMC 0609, Appendix F was applied in addition to the following assumptions specific for Indian Point Nuclear Generating Unit 2 cable construction and detail:

- All cables are treated as thermoplastic with damage potential described in Tables A7.2 and A7.3;
- All cables are jacketed with an asbestos braid and do not act as intervening combustibles or contribute to fire spread; and,
- Asbestos cable jacket is not credited as a thermal or radiant heat shield.

The inspectors walked down each of the individual fire zones to identify potential fire damage scenarios to circuits that were not protected to the requirements of 10 CFR Part 50, Appendix R, Paragraph III.G.2. For the vapor containment fire area and its associated operator manual actions, the inspectors reviewed a video that was recorded by the licensee in the previous Unit 2 refueling outage specifically for this inspection purpose and at the request of the NRC inspectors.

A summary of the risk evaluation for each OMA and its associated denied or missed OMAs is in a table at the end of this Analysis section. In general, all of the fire zones except FZ F/6 screened out because:

- Detailed circuit and cable analysis demonstrated that cable damage could not cause spurious operations to credited safe shutdown equipment. The safe shutdown analysis that was used by ENO to formulate conclusions on the protection of safe shutdown capability in their exemption request was overly conservative. Because damage to these cables would not cause a malfunction of safe shutdown equipment, the associated OMAs were unnecessary and were not violations of 10 CFR Part 50, Appendix R, III.G.2.;
- An ignition source did not exist that could credibly cause cable damage. The cables were sufficiently separated from all fixed ignition sources to not be damaged from thermal or radiant heat and a transient fire with an assumed origin two feet above the floor would also not generate sufficient thermal or radiant heat to damage cables at their high elevations; or,
- The only credible ignition source was a transient combustible fire and the associated weighting factor was very low, i.e., the critical floor area was much smaller than the plausible floor area for the assumed transient combustible fire.

For fire zone F6 and its associated denied OMA, OMA 6, the postulated fire resulted from an oil leak of the 22 charging pump fluid drive causing damage to the pump itself and the cabling associated with the operation and controls for the charging pump suction valves. There are two suction paths available to the charging pumps: 1) the volume control tank (VCT) from a normally open motor operated valve (MOV) 112C which is physically located in the VCT room, and 2) the refueling water storage tank (RWST) from

a normally closed air operated valve (AOV) 112B, which is located in the 22 charging pump cell or FZ F/6. Valve 112B is designed to open automatically in the event of a low VCT level through 112B valve position monitoring circuitry. Under these conditions, 112C would also close. The fire was conservatively assumed to render 112B failed closed and close 112C due to cable damage to the 112B position monitoring circuit. The denied OMA 6 included actions within FZ F/6 to locally open the 112B bypass valve 288 and in the VCT room to verify closed 112C. These actions were necessary to align the RWST as a suction source before starting the credited 21 charging pump from the main control room.

Due to uncertainties involved in fire induced core damage assessment, the SRA conducted two bounding analyses: 1) a fire model case based on fire modeling which assumed that only equipment in the subject fire area was potentially damaged and all other equipment failed probabilistically, and 2) an Appendix R case where only equipment credited in the safe shutdown analysis was available. For the Phase 3 SDP results, the SRA chose the fire model case as it represented the more realistic plant and operator response to a potential fire in FZ F/6.

Both analyses were conducted for FZ F/6 using the IP2 SPAR model version 8.20 to estimate the increase in conditional core damage probability if the denied OMAs were needed vice not needed and Appendix R requirements were met such that all mitigating operations were available from the control room. The IP2 SPAR model credits the charging pumps as an emergency boration source during an anticipated transient without scram (ATWS) and as a source of reactor coolant pump (RCP) seal injection. RCP seal injection along with the RCP thermal barrier cooling from the closed cooling water system (CCW) provides RCP seal cooling and precludes a RCP seal failure loss of coolant accident. This core damage analysis differed from the Appendix R guidelines to maintain or restore RCS pressurizer level. An independent Region I SRA reviewed and found acceptable the SPAR model changes made to conduct these analyses. Both analyses assumed that a fire in FZ F/6 would:

- Occur at a frequency of $5.0E-5$ per year consistent with Attachment 4 of the Fire Protection SDP for a pump oil fire;
- Only occur if the 22 charging pump was running;
- Fail the 22 charging pump;
- Fail 112B closed; and,
- Result in operator responses in accordance with procedures;
 - A manually initiated reactor trip, which was reflected as a transient initiation event; and,
 - Removing pressurizer power operated relief valve (PORV) control power fuses in the control room to prevent spurious PORV operation. This action was assumed always successful. For ATWS sequences, it was assumed that all PORVs and RCS safety valves would be open and that operators would not remove fuses to close the PORVs, but would continue to recover a charging pump and establish emergency boration.

The fire model analysis estimated an increase in the core damage frequency less than $1\text{E-}9$, if the OMAs were not successful, given the estimated 22 charging pump lube oil fire occurred at a frequency of $5\text{E-}5$ per year and the very limited credit afforded the charging pumps in core damage mitigation. The dominating core damage sequence involving the OMAs was an ATWS following the manual reactor trip caused by mechanical binding of all the control rods, and a failure of operators to manually open 288 to establish emergency boration with the 21 charging pump. The negligible increase in core damage frequency was also due to the extremely low probability of an ATWS where emergency boration would be necessary or a common cause failure of the service water system which would lead to a RCP seal failure. This analysis allowed normal plant equipment to remain functional provided it was not damaged as a result of the fire scenario based on fire modeling. The fire model analysis assumed that a fire in FZ F/6 would:

- Fail 112C closed with the probability of an intra-conduit hot short of 0.05, based on NUREG/CR-6850. Fail 112C open with a 0.95 probability. If 112C failed open, it must be closed to restore the RWST suction to the 21 charging pump.
- Not generate a damaging hot gas layer nor damage any equipment in the adjacent primary auxiliary building corridor, FZ F/7A. This assumption was based on fire modeling.
- Result in control room operators in accordance with procedure promptly disabling the 21 charging pump from automatic operation. This action is required by procedure to preclude damage to the 21 charging pump should it operate without a water source aligned to its suction as the result of spurious valve operations. A failure probability of $1.1\text{E-}2$ was assumed based on SPAR-H², assuming diagnosis and all factors in their nominal state.
- Result in operators implementing the denied OMAs in accordance with procedures and specifically aligning the RWST to the charging pumps suction after the fire is extinguished and includes:
 - Manually opening valve 288 with a failure probability of $2.3\text{E-}1$ assumed based on SPAR-H with all factors in their nominal state except for high stress and conservatively assuming barely sufficient time.
 - Verify or close 112C with a failure probability of $2.3\text{E-}1$ assumed based on SPAR-H with all factors in their nominal state except for high stress and conservatively assuming barely sufficient time.
- Result in control room operators, starting the 21 charging pump, in accordance with procedure, once suction to the RWST was aligned by the OMAs. A failure probability of $1.1\text{E-}2$ was assumed based on SPAR-H assuming diagnosis and all factors in their nominal state.

The Appendix R analysis estimated an increase in the core damage frequency in the mid-E-7 range. The Appendix R analysis assumed no credit afforded the charging pumps in the dominating core damage sequence. In the Appendix R analysis, the OMAs did not impact the core damage frequency results. The dominating core damage sequence involved a RCP loss of seal cooling event leading to a small loss of coolant accident due to RCP seal failure at a leak rate of 182 gpm per RCP and successful operation of the 21 AFW train. Although 21 AFW was successful, core damage occurs because the reactor cannot be depressurized because PORV fuses are removed by

procedure failing the PORVs closed, and high pressure coolant injection is assumed to have failed in the Appendix R analysis. If a loss of RCP seal cooling does not occur, the dominant core damage sequence included failure of the 21 AFW train (in the range of 1 in 125) and the inability, using high pressure coolant injection and the PORVs (feed and bleed), to remove decay heat. The Appendix R analysis assumed that a fire in the FZ F/6 would:

- Cause a loss of RCP seal cooling and subsequent RCP seal failure. A loss of RCP seal cooling occurred due to the fire induced closures of 112C and a CCW system MOV in the RCP thermal barrier cooling flow path. In this case, with a fire in the 22 charging pump cell, operators would not be able to open valve 288 to establish a suction path to the 21 charging pump in sufficient time to prevent the assumed RCP seal failure.
- Cause a failure of all equipment within fire area F including:
 - Both trains of high pressure injection.
 - 22 train of low pressure injection.
 - Motor control centers 26A and 26B.
- Cause failure of the 22 motor driven and 23 turbine driven AFW pumps.

The table below summarizes the results for each OMA with its respective fire zone:

Indian Point Unit 2 Denied OMA Summary Table

Fire Area/ Zone	OMA No.¹	Violation of III.G.2	Risk Increase Results
		Comments	
F/5A	6	No Based on circuit reviews, cables of interest within this FZ do not result in a spurious operation that necessitates this OMA.	No increase
F/6	6	Yes This area required a detailed phase 3 SDP analysis. The inspectors assumed a 5200kW fire from 54 gallons of oil leaked from the 22 charging pump fluid drive within a 40 sqft skid 15.5ft directly below cable YZ1-JB5. Details of the phase 3 SDP analysis are described in the analysis section prior to this table.	Negligible increase based on detailed Phase 3 SDP analysis
	7	No Based on circuit reviews, cables of interest within this FZ do not result in a spurious operation that necessitates this OMA.	No increase
F/7A	6	Yes There were no fixed or assumed transient combustible ignition sources that could credibly damage cable YZ1-JB5 which is located 14ft above the floor.	Screened based on Phase 2 SDP tasks

	7	No	Based on circuit reviews, cables of interest within this FZ do not result in a spurious operation that necessitates this OMA.	No increase
	20	Yes	The only credible ignition source was a transient combustible fire and the associated transient weighting factor was very low, i.e. an 8sqft critical floor area compared to 6000sqft plausible floor area equals a $2.3E-7$ area weighting factor.	Screened based on Phase 2 SDP tasks
	21	Yes	See above, same as F/7A for OMA 20.	Screened based on Phase 2 SDP tasks
F/22A	6	No	Based on circuit reviews, cables of interest within this FZ do not result in a spurious operation that necessitates this OMA.	No increase
F/27A	5	Yes	This OMA involves opening a manual valve, 227, to align a charging path to the reactor coolant system if the normally open air operated valve, HCV-142, were to close from a loss of instrument air (IA). Circuits to HCV-142 do not route through the associated FZs. Therefore this OMA is only necessary for a fire induced loss of IA. The inspectors walked down each FZ and did not identify any IA lines near ignition sources. Additionally, a loss of IA resulting from the spurious operation of several IA loads and a subsequent high demand on the IA system would require multiple spurious operations.	Screened based on Phase 2 SDP tasks
F/33A	6	Yes	The only credible ignition source to cable CK1-YP3, power supply cable to 112C, is the motor control center where CK1-YP3 terminates. This is a fire damage state zero scenario (FDS0). FDS0 scenarios are not analyzed in the SDP as a risk contributor. See step 2.2 of IMC 0609, Appendix F.	No increase
	5	Yes	See above, same as F/27A for OMA 5.	Screened based on Phase 2 SDP tasks
F/59A	5	Yes	See above, same as F/27A for OMA 5.	Screened based on Phase 2 SDP tasks

H/72A	8	Yes	This FZ is in the vapor containment (VC) and was not accessible to the inspectors for walkdown. NRC inspectors walkdown the VC as part of the baseline inspection program following plant outages and just prior to plant startup in part to verify the licensee has thoroughly removed all outage materials and combustibles. The licensee performs similar inspections prior to startup. The inspectors observed the FZ using a video recording taken by the licensee during the most recent refuel outage. Additionally, the inspectors reviewed the spatial separation between ignition sources and cables of concern as described in ENO's September 29, 2010 response to the NRC's request for additional information on August 11, 2010 (ML102930237).	Screened based on Phase 2 SDP tasks
H/75A	8, 9, 10	Yes	See above, same as H/72A for OMA 8.	Screened based on Phase 2 SDP tasks
H/77A	8, 9, 10	Yes	See above, same as H/72A for OMA 8.	Screened based on Phase 2 SDP tasks
H/84A	8	Yes	See above, same as H/72A for OMA 8.	Screened based on Phase 2 SDP tasks
H/85A	8	Yes	See above, same as H/72A for OMA 8.	Screened based on Phase 2 SDP tasks
H/87A	8, 9, 10	Yes	See above, same as H/72A for OMA 8.	Screened based on Phase 2 SDP tasks
J/19	11	No	Based on circuit reviews, cables of interest within this FZ do not result in a spurious operation that necessitates this OMA.	No increase
J/25	12	No	See above, same as J/19 for OMA 11.	No increase
J/39A	11, 12	No	See above, same as J/19 for OMA 11.	No increase

J/43A	11, 12, 13	No	See above, same as J/19 for OMA 11.	No increase
J/45A	11	No	See above, same as J/19 for OMA 11.	No increase
J/46A	11, 12, 13	No	See above, same as J/19 for OMA 11.	No increase
J/47A	11	No	See above, same as J/19 for OMA 11.	No increase
J/50A	11, 12	No	See above, same as J/19 for OMA 11.	No increase
J/270	12	No	See above, same as J/19 for OMA 11.	No increase
K/60A	14, 15, 19	Yes	Based on circuit reviews there are no cables within these FZs that also result in a loss of main feedwater with the assumed fire-induced loss of auxiliary feedwater from cable damage. Therefore a fire within this fire zone will not result in a plant transient from spurious operations.	Screened based on Phase 2 SDP tasks
K/65A	14, 15, 19	Yes	Based on circuit reviews there are no cables within these FZs that also result in a loss of main feedwater with the assumed fire-induced loss of auxiliary feedwater from cable damage. Therefore a fire within this fire zone will not result in a plant transient from spurious operations.	Screened based on Phase 2 SDP tasks

¹As identified in table on pages 1 through 4 of Attachment 1 to ENO response letter to the NRC dated March 1, 2012 (ML12074A028). OMAs 20 and 21 were NRC identified during plant walkdowns and are described in the following list.

Description of Indian Point Unit 2 Denied OMAs

5. Open HCV-142 bypass valve 227 to align charging pump makeup path to the reactor coolant system (RCS).
6. Align charging pump suction source to the refueling water storage tank (RWST).
7. Transfer instrument buses 23 and 23A to alternate power.
8. Fail open valves 204A (charging flow to the RCS loop 2 hot leg) and 204B (charging flow to RCS loop 1 cold leg) to align charging pump makeup path to the RCS.
9. Activate or enable alternate safe shutdown system (ASSS) pneumatic instruments (steam generator level, pressurizer pressure and pressurizer level) at the fan house local control panel.
10. Enable ASSS source-range channel and RCS loop 21 and 22 hot leg and cold leg temperature channels.

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11. Trip breakers 52/5A and 52-SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and remove control power fuses.
12. Transfer instrument buses 23 and 23A to emergency power source.
13. Align charging pump suction to the RWST.
14. Operate transfer switch EDC5 and close supply breaker at substation 12FD3 to transfer the 21 auxiliary feedwater pump (AFW) to the ASSS power source.
15. Open the 21 AFW pump recirculation bypass valve BFD-77.
19. Operate the 21 AFW pump flow control valves to control AFW flow to steam generators 21 and 22.
20. Locally operate the 21 charging pump scoop tube positioner. OMA 20 was NRC identified during plant walkdowns and its use in lieu of meeting 10 CFR Part 50, Appendix R, Section III.G.2 requirements was not included in the exemption request submitted to the NRC on March 6, 2009 (ML090770151).
21. Locally start the 21 charging pump using the emergency control station located in the 480V switchgear room. OMA 21 was NRC identified during plant walkdowns and its use in lieu of meeting 10 CFR 50, Appendix R, Section III.G.2 requirements was not included in the exemption request submitted to the NRC on March 6, 2009 (ML090770151).

Enforcement. Indian Point Unit 2 Operating License Condition 2.K specifies, in part, that Entergy Nuclear Operations, Inc., shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Updated Final Safety Analysis Report. The Updated Final Safety Analysis Report, Section 9.6 specifies that ENO will meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 which identifies the means of protecting post-fire safe shutdown equipment from fire damage. Contrary to the above, between June 30, 2006 and April 26, 2012, ENO failed to implement their fire protection program by using one of the means described in Appendix R, Section III.G.2 to protect circuits required for post-fire safe shutdown from fire-induced circuit damage. Specifically, ENO used unapproved operator manual actions to mitigate post-fire safe shutdown equipment malfunctions without having obtained NRC approval. The specific operator manual actions and fire areas and fire zones that are in violation of Appendix R, Section III.G.2 are listed in the Indian Point Unit 2 Denied OMA Summary Table of this inspection report. This finding is being cited because not all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation were satisfied. Specifically, ENO failed to restore compliance within a reasonable amount of time after the violation was identified in RIS 2006-10 on June 30, 2006.

VIO 05000247/2012009-01, Failure to Protect Safe Shutdown Equipment from the Effects of Fire.

2. Failure to Protect Safe Shutdown Equipment from the Effects of Fire (Unit 3)

Introduction. The inspectors identified a finding of very low safety significance (Green), involving a cited violation of Indian Point Unit 3 Operating License Condition 2.H to implement and maintain all aspects of the approved fire protection program. Specifically, ENO failed to protect required post-fire safe shutdown components and cabling to ensure one of the redundant trains of equipment remained free from fire damage as required by 10 CFR Part 50, Appendix R, Section III.G.2. In lieu of protecting a redundant safe shutdown train, ENO utilized unapproved operator manual actions to mitigate component malfunctions or spurious operations caused by postulated single fire-induced circuit faults. ENO submitted an exemption request (ML090760993) on March 6, 2009, in which it sought exemption from requirements of Paragraph III.G.2, to permit the use of OMAs upon which it had been relying for safe-shutdown in a number of fire areas. However, several OMAs within the exemption request were denied because ENO failed to demonstrate that the OMAs were feasible and reliable, or to appropriately evaluate fire protection defense-in-depth. ENO's performance deficiency delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown.

Description. On June 30, 2006, the NRC issued Regulatory Issue Summary (RIS) 2006-10, Regulatory Expectations with Appendix R, Paragraph III.G.2, Operator Manual Actions, which clarified Appendix R and that OMAs are not permitted, unless they have been specifically approved by the NRC as part of a licensee's request for exemption from the requirements of Paragraph III.G.2. In addition to information provided to the licensees in RIS 2006-10, the NRC issued enforcement guidance memorandum (EGM) 07-004, which granted enforcement discretion for licensees relying on noncompliant OMAs to bring the facility back into compliance with the existing regulations. The enforcement discretion provided licensees until March 6, 2009, to complete corrective actions.

ENO submitted exemption requests on March 6, 2009 for OMAs in several non-compliant fire areas. The NRC considered ENO's exemption requests, as supplemented by information provided by ENO in response to NRC requests for additional information and on February 1, 2012, the NRC denied many of the requested exemptions based on lack of fire protection defense-in-depth, such as detection or automatic suppression, or lack of time margin available to complete the OMA. The NRC's denial of several OMAs within the exemption requests was based on guidance to the NRC staff and available to the industry. NUREG 1852, Demonstrating the Feasibility and Reliability of OMAs in Response to Fire, published October 2007, page 1-2, states that additional considerations to ensure that adequate defense-in-depth such as fire detection and suppression is maintained are addressed in Regulatory Guide 1.189 and should be considered when applying for an exemption or license amendment. RG 1.189, Fire Protection Program for Nuclear Power Plants, Rev. 1, March 2007, (in effect when NUREG 1852 was issued) Section 5.3.3 similarly states that all fire-related operator manual actions must be feasible and reliable. RG 1.189 further states that the use of operator manual actions does not obviate the detection and suppression capabilities that are required by the regulations and in addition, the omission or elimination of these capabilities in an area containing systems, structures, or components (including circuits)

important to safety would generally be considered an adverse effect on safe shutdown since it would reduce, at a minimum, fire protection defense-in-depth.

ENO's failure to demonstrate that several OMAs were feasible and reliable, and to appropriately evaluate fire protection defense-in-depth delayed achieving full compliance with fire protection regulations and adversely affected post-fire safe shutdown. ENO entered this issue into its CAP for long term resolution as CR-IP3-2012-00369. Interim compensatory measures for the fire protection non-compliances included roving fire watches in all affected fire areas and were initiated in June 2011. The inspectors considered the interim compensatory measures reasonable pending final resolution. ENO responded to the NRC in a letter dated March 1, 2012, (ML12074A028) with a proposed schedule to resolve all Unit 3 non-compliances by the fourth quarter of 2012.

Analysis. The inspectors identified a performance deficiency in that ENO failed to protect components credited for post-fire safe shutdown from fire-induced damage. The performance deficiency was more than minor because it was associated with the Protection against External Events (Fire) attribute of the Mitigating Systems Cornerstone and negatively affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences in the event of a fire. Specifically, the use of OMAs during post-fire shutdown is not as reliable as normal system operation from the main control room which would be utilized had the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 been met. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and an SRA conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). This finding did not have a cross cutting aspect because the performance deficiency occurred greater than three years ago when the exemption request was submitted to the NRC on March 6, 2009, and is not indicative of current licensee performance.

The inspectors determined the issue did not screen with a Phase 1 SDP because the finding category was post-fire safe shutdown and involved operator manual actions. A Phase 3 SDP was performed by a Senior Reactor Analyst (SRA) because the Fire Protection Phase 2 SDP is intended to support the assessment of known issues only in the context of an individual fire area and this issue involved multiple fire areas and fire zones. However, the SRA determined the Phase 2 SDP tools could be used on an area by area basis to inform the Phase 3 SDP and screen fire zones if a sufficient basis was developed for each fire zone and justified an absence of credible fire scenarios, such that mitigating equipment or its associated cables would not be damaged or a plant transient would not occur. Guidance in each attachment of IMC 0609, Appendix F was applied in addition to the following assumptions specific for Indian Point Nuclear Generating Unit 3 cable construction and detail:

- All cables are treated as thermoplastic with damage potential described in Tables A7.2 and A7.3;
- All cables are jacketed with an asbestos braid and do not act as intervening combustibles or contribute to fire spread; and,
- Asbestos cable jacket is not credited as a thermal or radiant heat shield.

The inspectors walked down each of the individual fire zone to identify potential fire damage scenarios to circuits that were not protected to the requirements of 10 CFR Part 50, Appendix R, Paragraph III.G.2.

One of the unapproved OMAs which was associated with several fire zones was local manual operation of the service water pump strainer backwash. This OMA was determined to be beyond the scope of an OMA and was documented in a Green non-cited violation in 2011 (Inspection Report 05000286/2011008, ML111920339). The very low risk for this OMA was related to the very low likelihood of ever needing the strainer backwash to operate during a post-fire safe shutdown. With the exception of FZ PAB 2{3}/6, all remaining fire zones and associated OMAs screened because there were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern within the fire zones.

For FZ PAB-2{3}/6, the 32 charging pump cubicle, the SRA assumed a lube oil fire while the 32 charging pump was in operation damages cables to the volume control tank (VCT) motor operated outlet valve (112C). The SRA compared differences between Unit 2 and Unit 3 for the 22 and 32 charging pump cubicle fire scenarios. The only noted differences between plant configurations or operating procedures was the 112B valve design and the fire zone configurations. The 112B valve at Unit 2 was a normally closed air operated valve, and at Unit 3 the 112B valve was a normally closed motor operated valve. At Unit 3, the 31 and 32 charging pumps were in the same fire zone (PAB-2{3}/6), but an exemption was previously granted that found the fire barriers between the charging pump cubicles acceptable and the 31 charging pump was credited in the event of a fire in the 32 charging pump cubicle. Both differences between the Unit 22 and 32 charging pump fire scenario would not change the fire damage or risk analysis assumptions. Because there was no applicable difference between the Unit 2 and Unit 3 charging pump fire scenario, the results of the Unit 2 detailed Phase 3 SDP analysis can be used to determine that the increased risk from this fire scenario is negligible.

The table below summarizes the results for each OMA with its respective fire zone:

Indian Point Unit 3 Denied OMA Summary Table

Fire Area/ Zone	OMA No.²	Violation of III.G.2	Risk Increase Results
		Comments	
ETN-4{1}/7A	6,8	Yes There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
ETN-4{1}/60A	5,6,8,9,10, 11,12	Yes There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks

	13	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low
ETN-4{3}/73A	14,15,16,17	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{3}/6	18	Yes	This zone was described in detail in the analysis section above this table.	Negligible based on detailed Phase 3 SDP analysis
PAB-2{5}/17A	22	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{5}/19A	19,20	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{5}/20A	22	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{5}/27A	22	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{5}/30A	22	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
PAB-2{5}/59A	21	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks

TBL-5/37A	25	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low
TBL-5/38A	25	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low
TBL-5/43A	25	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low
TBL-5/44A	25	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low
TBL-5/52A	23,24	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
TBL-5/54A	24	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
YARD-7/222	26	Yes	There were no fixed or assumed transient combustible ignition sources that could credibly damage the cable of concern in this area.	Screened based on Phase 2 SDP tasks
	27	Yes	This OMA was previously identified as a violation during the last triennial fire protection inspection and was documented in that report as a very low safety significance (Green) NCV.	Previously evaluated as very low

²As identified in table on pages 1 through 5 of Attachment 2 to ENO response letter to the NRC dated March 1, 2012 (ML12074A028).

Description of Indian Point Unit 3 Denied OMAs

5. Operate HCV-1118 manually to control 32 AFW pump.
6. Align Appendix R Diesel Generator (ARDG) to 480 V Buses 2A, 3A, 5A, and 312.

Enclosure 2

8. Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to Steam Generators (SGs).
9. Locally open valve 227 to establish charging makeup flowpath to Reactor Coolant System (RCS).
10. Locally close Level Control Valve (LCV)-112C and open valve 288 to align charging pump suction to the Refueling Water Storage Tank (RWST).
11. Locally operate Pressure Control Valve (PCV)-1139 to ensure steam supply to 32 AFW pump.
12. Locally operate PCV-1310A and PCV-1310B to ensure steam supply to 32 AFW pump.
13. Locally manually perform Service Water (SW) pump strainer backwash as required.
14. Operate HCV-1118 manually to control 32 AFW pump.
15. Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.
16. Locally operate 32 PCV-1310A, PCV-1310B to ensure steam supply to 32 AFW pump.
17. Locally operate FCV-405C and FCV-405D to control AFW flow to SG.
18. Locally close valve LCV-112C and open valve 228 to align charging pump suction path to RWST.
19. Locally close supply breaker for 32 Charging Pump.
20. Locally control 32 charging pump using scoop tube positioner.
21. Open bypass valve 227 to establish charging flowpath to RCS around potentially failed closed HCV-142.
22. Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.
23. Locally operate [bypass valve for] FCV-1121 AFW pump recirculation valve during pump startup.
24. Locally operate FCV- 406A and FCV-406B to control AFW flow to SGs.
25. Locally/manually backwash SW pump strainer as required if power to strainer associated with selected SW pump is lost.
26. Locally start ARDG to supply Motor Control Center (MCC) 312A in support of the use of SW pump 38.

27. Locally/manually backwash SW Pump strainer as required if power to strainer associated with selected SW pump is lost.

Enforcement. Indian Point Unit 3 Operating License Condition 2.H specifies, in part, that Entergy Nuclear Operations, Inc., shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Final Safety Analysis Report. The Final Safety Analysis Report, Section 9.6.2, specifies that ENO will meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2, which identifies the means of protecting post-fire safe shutdown equipment from fire damage. Contrary to the above, between June 30, 2006 and April 26, 2012, ENO failed to implement their fire protection program by using one of the the means described in Appendix R, Section III.G.2, to protect circuits required for post-fire safe shutdown from fire-induced circuit damage. Specifically, ENO used unapproved operator manual actions to mitigate post-fire safe shutdown equipment malfunctions without having obtained NRC approval. The specific operator manual actions and fire areas and fire zones that are in violation of Appendix R, Section III.G.2, are listed in the Indian Point Unit 3 Denied OMA Summary Table of this inspection report. This finding is being cited because not all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation were satisfied. Specifically, ENO failed to restore compliance within a reasonable amount of time after the violation was identified in RIS 2006-10 on June 30, 2006.

VIO 05000286/2012008-01, Failure to Protect Safe Shutdown Equipment from the Effects of Fire.

3. Violation of Combustible Controls Program

Introduction. The inspectors identified a Green, Non-Cited Violation (NCV) of the Indian Point Nuclear Generating Unit No. 2 Amended Facility Operating License, Condition 2.K, in that ENO failed to implement and maintain in effect all provisions of the NRC-approved FPP as described in the Updated Final Safety Analysis Report (UFSAR). Specifically, ENO failed to minimize transient combustible materials within the primary auxiliary building (PAB) and stored a compressed gas cylinder containing hydrogen gas under cable trays.

Description. While walking down electrical cables that were associated with denied OMA exemptions, the inspectors identified a gas cylinder underneath cable trays in fire zone (FZ) F/7A of the PAB. The gas cylinder was not in use, a valve protection cap was installed, and the gas cylinder was chained to a corridor wall to prevent accidental movement or tipping. The gas cylinder's contents were unknown and without label other than a sticker indicating the contents were flammable.

ENO removed the gas cylinder from the PAB and evaluated its contents. The gas cylinder was a mixture of 50 percent hydrogen and 50 percent nitrogen gasses and was previously in service as a calibration gas for the waste gas analyzer in FZ F/8A of the PAB. It contained about 150 psig of gas. FZ F/8A is an authorized storage location for an in service hydrogen calibration gas cylinder, and FZ F/7A is not an authorized storage location for any hydrogen gas cylinders.

The storage of a hydrogen compressed gas cylinder in FZ F/7A of the PAB was not in accordance with ENO procedure, Control of Combustibles, EN-DC-161, Rev. 6, and a flammable compressed gas was not practically minimized. EN-DC-161, among other requirements, requires plant workers to: 1) limit transient combustibles to those materials and quantities necessary to support work activities, 2) not place transient combustibles directly under cable trays, and 3) determine the need for a formal Transient Combustible Evaluation (TCE).

ENO promptly entered this issue into its CAP as CR-IP2-2012-03036, and removed the hydrogen cylinder from the PAB. ENO initiated a corrective action to evaluate the identified condition and ensure actions to prevent its recurrence.

Analysis. ENO's failure to remove the compressed hydrogen gas cylinder from the PAB after its intended use as a calibration gas for the waste gas analyzer was a performance deficiency. This finding was more than minor because it was associated with the External Factors attribute (fire) of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the hydrogen gas cylinder was stored below cable trays in an area that includes safe shutdown circuits and the associated cables were at increased risk to fire damage. The inspectors used IMC 0609, Appendix F, Fire Protection Significance Determination Process, Phase 1 and a Senior Reactor Analyst conducted a Phase 3 evaluation, to determine that this finding was of very low safety significance (Green). The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance associated with the work practice attribute because ENO personnel did not follow procedure, Control of Combustibles, EN-DC-161, Rev. 6, as written and did not remove the hydrogen gas cylinder from the PAB after it was disconnected from the waste gas analyzer contrary to Control of Combustibles, EN-DC-161, Rev. 6. (H.4(b) per IMC 0310).

The inspectors used Attachment 2 of IMC 0609, Appendix F, Fire Protection Significance Determination Process (SDP), and assigned a high degradation rating for this combustible controls program finding. Accordingly, this finding did not screen to Green in Phase 1 of IMC 0609, Appendix F, and a Phase 3 analysis was performed by a Senior Reactor Analyst (SRA) using similar assumptions and methodologies as the denied OMA findings.

Conduct of the phase 3 SDP included identifying the damage that could result based on detailed plant walkdowns, review of ENO provided circuit information, fire modeling evaluation of potential damage to plant equipment, and use of probabilistic fire analysis methods documented in NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection SDP" and NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities." The SRA analyzed the risk of a single hydrogen gas cylinder fire located directly below the cables in FZ F/7A that may cause the charging pumps to lose suction by closing the volume control tank (VCT) outlet valve (112C). Because the hydrogen compressed gas cylinder was stored along a PAB corridor in FZ F/7A without controls or regards to its combustibility or flammability, the SRA assumed for the purposes of analyzing risk from fire, that the hydrogen gas cylinder was located directly

beneath cables that if damaged may spuriously close 112C. Closure of 112C causes the charging pumps to lose suction and OMAs are required to restore the VCT suction or align the refuel water storage tank (RWST) as an alternate source by opening air operated valve 112B. The normally open 112C is physically located in the VCT room, not in FZ F/7A, and the normally closed 112B, is located in the 22 charging pump cell FZ F/6. Valve 112B is designed to open automatically in the event of a low VCT level, which through 112B valve position monitoring circuitry would cause the normal VCT suction valve 112C to close. The 112B valve position monitoring circuit cable runs from FZ F/6, where 112B is located, through FZ F/7A. The fire is assumed to result in 112B failing to open due to direct power supply cabling damage and 112C failing closed due to damage to the 112B position monitoring circuit wiring. The denied OMAs for FZ F/7A were used in this analysis. These OMAs included the manual opening of the 112B bypass valve (288), the verification or closure of 112C, and starting the 21 charging pump, after the RWST suction is aligned, using the emergency control station in the 480V switchgear room.

The SRA conducted a detailed probabilistic analysis for FZ F/7A, using the IP2 SPAR model version 8.20 to estimate the conditional core damage probability if the fire were to occur. This analysis represented a fire model estimate that allowed normal plant equipment to remain functional if it would not be damaged based on fire modeling of the actual plant configuration. The analysis determined a negligible increase in core damage frequency (less than 1 in one billion years), given an estimated $6.5E-4$ per year fire frequency (consistent with Attachment 4 of the Fire Protection SDP for a hydrogen storage tank) and the conditional core damage probability calculated (if the performance deficiency had not occurred there was no credible ignition source). An independent Region I SRA reviewed and found acceptable the SPAR model changes made to conduct the analysis, which were based on following assumptions that a fire in FZ F/7A would:

- Cause operators to manually initiate a reactor trip from the control room, which was reflected as a transient initiation event.
- Fail the running charging pump.
- Fail 112B closed.
- Fail 112C closed with a probability of an intra-cable hot short of 0.30, based on NUREG/CR-6850 or fail it open with a 0.70 probability. If MOV-112C fails open it must be manually closed as part of restoring the RWST suction flowpath to the 21 charging pump.
- Not generate a hot gas layer in the PAB corridor and not damage any cabling or equipment outside of FZ F/7A based on fire modeling.
- Result in control room operators in accordance with procedures:
 - Removing control power fuses for both PORVs in the control room to prevent spurious opening which was assumed always successful. For ATWS sequences, all PORVs and RCS safety valves would be open and operators would not pull the fuses to close the PORVs, but would continue to recover charging to establish emergency boration.
 - Promptly disabling the 21 charging pump from automatic operation. This action is required by procedure to preclude damage to the 21 charging pump should it operate without a water source aligned to its suction as

the result of spurious valve operations. A failure probability of $1.1\text{E-}2$ was assumed based on SPAR-H¹, assuming diagnosis and all factors in their nominal state.

- Result in operators implementing the denied OMAs in accordance with procedures and specifically aligning the RWST to the charging pumps suction after the fire is extinguished and includes:
 - Manually opening valve 288 with a failure probability of $2.3\text{E-}1$ assumed based on SPAR-H with all factors in their nominal state except for high stress and conservatively assuming barely sufficient time.
 - Verify or close 112C with a failure probability of $2.3\text{E-}1$ assumed based on SPAR-H with all factors in their nominal state except for high stress and conservatively assuming barely sufficient time.
- Result in operators implementing the missed OMA to start the 21 charging pump from the emergency control station in the 480 V switchgear room after the RWST suction was aligned. This action was assigned a failure probability of $2.9\text{E-}1$ based on SPAR-H assuming diagnosis and all factors in their nominal state except for incomplete and poor procedures. Incomplete and poor procedures was chosen because operators knew of the emergency control station in the switchgear room, and because it was incorporated in the post-fire safe shutdown following control room abandonment, however, use of the emergency control station was not in the procedure used for a PAB fire.

The dominating core damage sequence involving the hydrogen calibration gas cylinder fire scenario was an ATWS caused by mechanical binding of all control rods and a failure of the operator to manually open 288 to establish emergency boration with the 21 charging pump. The negligible increase in core damage frequency (less than 1 in one billion years) is due to the $6.5\text{E-}4$ per year initiating event frequency and the extremely low chances of an ATWS situation where emergency boration would be necessary or a common cause failure of the SW system would lead to a reactor coolant pump seal failure.

Enforcement. Entergy Nuclear Operations, Inc.(ENO), Operating License, Condition 2.K, requires, in part, that ENO shall implement and maintain in effect all provisions of the NRC-approved FPP as described in the UFSAR. UFSAR Section 9.6.2 references the FPP as described in three ENO documents, one of these documents is the Indian Point Energy Center (IPEC) Fire Protection Program Plan, SEP-FPP-IP-001, Rev. 0. Control of Combustibles, EN-DC-161, Rev. 6, is referenced in the IPEC FPP Plan and, in part, requires plant workers to: 1) limit transient combustibles to those materials and quantities necessary to support work activities (Section 5.2[1]), 2) not place transient combustibles directly under cable trays, (Section 5.2[4]), (Section 5.5[1](d)), and 3) determine the need for a formal Transient Combustible Evaluation (TCE) (Section 5.6[2]). Contrary to the above, a compressed gas cylinder containing hydrogen gas was left in FZ 7A of the PAB on an unknown date of the PAB. The unauthorized storage of a hydrogen gas bottles was identified by the NRC on April 25, 2012. Because this finding was of very low safety significance (Green) and has been entered into ENO's corrective action program (CR-IP2-2012-03036), this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000247/2012009-001, Violation of Transient Combustible Control Program)**

4OA6 Meetings, including ExitExit Meeting Summary

The inspectors presented their preliminary inspection results to Mr. Lawrence Coyle, General Manager, Plant Operations, and other members of the site staff at an exit meeting on April 26, 2012. Following in-office reviews, an additional meeting was conducted by telephone with Mr. Patric Conroy, Director, Nuclear Safety Assurance, on June 8, 2012, and an exit meeting was conducted by telephone with Mr. Patric Conroy, and other members of the site staff on July 20, 2012. No proprietary information was included in this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

P. Conroy, Director, Nuclear Safety Assurance
L. Coyle, General Manager, Plant Operations
J. Cottam, Fire Protection Engineer
G. Dahl, Licensing Specialist
K. Elliot, Safe Shutdown Engineer
M. Tesoriero, Manager, Programs and Components

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000247/2012009-01	VIO	Failure to Protect Safe Shutdown Equipment from the Effects of Fire (Section 4OA2.1)
05000286/2012008-01	VIO	Failure to Protect Safe Shutdown Equipment from the Effects of Fire (Section 4OA2.2)

Opened and Closed

05000247/2012009-01	NCV	Violation of Transient Combustible Control Program (Section 4OA2.3)
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LIST OF DOCUMENTS REVIEWED

Fire Protection Licensing Documents

Unit 3 Technical Requirements Manual 3.7.B, Appendix R Safe Shutdown Equipment, Rev. 9
Letter from J. Bayne to H. Denton, Appendix R Exemption Request Information, Dated 11/22/82

Design Basis Documents

IP-RPT-05, IP2 10 CFR 50, Appendix R Safe-Shutdown Separation Analysis, Rev. 1
IP2-RPT-03-00015, IP2 Fire Hazards Analysis, Rev. 4
IP3-ANAL-FP-02143, Fire Hazards Analysis Report, Rev. 5
IP3-ANAL-FP-01503, Safe Shutdown Analysis Report, Rev. 2
SEP-FPP-IP-001, IPEC Fire Protection Program Plan, Rev. 0

Calculations/Engineering Evaluation Reports

EO-6068, Fire and Heat Resistance Tests on 600V Power and Control Cable and Switchboard Wires, Dated 8/20/71
IP-RPT-12-00008, IP3 OMAs 2 through 8 Evaluation, Draft
Evaluation of IP3 OMAs 18 through 22, Draft
Evaluation of IP3 OMA 26, Draft
PGI-00433, Combustible Loading Calculation, Rev. 6

Procedures

SAO-703, Fire Protection Impairment Criteria and Surveillance, Rev. 28
SEP-FPP-IP-002, IPEC Fire Watch Program, Rev. 0
EN-DC-161, Control of Combustibles, Rev. 6
EN-DC-127, Control of Hot Work and Ignition Sources, Rev. 11
EN-IS-109, Compressed Gas Cylinder Handling and Storage, Rev. 7

Operations Procedures

2-AOP-SSD-1, Control Room Inaccessibility Safe Shutdown Control, Rev. 18
2-ONOP-FP-001, Plant Fires, Revs. 7 & 8
2-SOP-ESP-001, Local Equipment Operation and Contingency Actions, Rev. 6
3-ONOP-FP-1, Plant Fires, Rev. 28
3-SOP-EL-012, Operation of the Alternative Safe Shutdown Equipment, Rev. 18
3-SOP-ESP-001, Local Equipment Operation and Contingency Actions, Rev. 21

Condition Reports

CR-IP2-2011-02417	CR-IP2-2012-01487	CR-IP3-2011-02325
CR-IP2-2011-03139	CR-IP2-2012-01585	CR-IP3-2011-02853
CR-IP2-2011-03695	CR-IP2-2012-03024	CR-IP3-2011-02951
CR-IP2-2011-03889	CR-IP2-2012-03036	CR-IP3-2011-02966
CR-IP2-2011-04608	CR-IP2-2012-03410	CR-IP3-2011-03497
CR-IP2-2011-06311	CR-IP3-2006-02747	CR-IP3-2011-03563
CR-IP2-2012-00643	CR-IP3-2011-00044	CR-IP3-2012-00369

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
ASSS	Alternate Safe Shutdown System
ATWS	Anticipated Transient Without Scram
CAP	Corrective Action Program
CCW	Closed Cooling Water
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
EGM	Enforcement Guidance Memorandum
ENO	Entergy Nuclear Operations, Inc.
FDS0	Fire Damage State Zero
FSAR	Final Safety Analysis Report
FZ	Fire Zone
GPM	Gallon Per Minute
IA	Instrument Air
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEC	Indian Point Energy Center
kW	Kilowatt
MOV	Motor Operated Valve
NCV	Non-Cited Violations
NRC	Nuclear Regulatory commission
OMA	Operator Manual Action
PAB	Primary Auxiliary Building
PAR	Publicly Available Records
PORV	Power Operated Relief Valve
PSIG	Pounds Per Square Inch Gauge
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RIS	Regulatory Issue Summary
RWST	Refuel Water Storage Tank
SDP	Significance Determination Process
SQFT	Square Feet
SRA	Senior Reactor Analyst
TCE	Transient Combustible Evaluation
VC	Vapor Containment
UFSAR	Updated Final Safety Analysis Report
V	Volt
VCT	Volume Control Tank